Supplemental Biological Assessment of the Effects of the Willamette River Basin Flood Control Project

EXECUTIVE SUMMARY

This document supplements the April 2000 Biological Assessment (BA) prepared to meet the requirements under Section 7 of the Endangered Species Act (ESA) with regard to continued operation and maintenance of the U.S. Army Corps of Engineers' (USACE) Willamette River Basin Project, Oregon, a system of 13 dams and reservoirs, an authorized navigation channel, and bank protection works. In the 2000 BA, the proposed action described the operation and maintenance of the Willamette Project prior to listing of the Upper Willamette River (UWR) spring Chinook salmon (*Oncorhynchus tshawytscha*) and winter steelhead (*Oncorhynchus mykiss*) as threatened in 1999. The 2000 BA concluded that continued operation of the Willamette Project was "likely to adversely affect" a number of species listed as threatened or endangered by the National Marine Fisheries Service and the U.S. Fish and Wildlife Service, collectively called the "Services." The 2000 BA was submitted to the Services with a request for simultaneous consultation. The Bonneville Power Administration and Bureau of Reclamation joined the USACE as "Action Agencies" in the consultation.

The Supplemental BA provides an update on the biological information for ESA-listed species, the environmental baseline condition, and analysis of the effects of a revised proposed action. The intent of the Supplemental BA was not to replace the 2000 BA, but to provide information on the changes influencing the consultation since the 2000 BA was completed. The proposed action in the 2000 BA represented the operation of the Willamette Project prior to the 1999 ESA-listing of UWR winter steelhead and spring Chinook. Since that time, the Action Agencies have implemented significant changes in operation of the Willamette Project. The Action Agencies have worked closely with the Services and others to adaptively manage operation of the project to provide timing and volume of flow releases that better meet the life cycle requirements of ESA-listed species. For example, in 2002 a protocol for meeting spring mainstem flow targets was developed and implemented. The spring flow targets are designed to improve movement of juvenile winter steelhead out of the system and adult spring Chinook into the system, and represent a significant change to system operation. Also, the water temperature control facility at Cougar Dam was completed in 2005 and resulted in an immediate improvement in downstream water temperatures for threatened spring Chinook salmon and other aquatic species.

Given these and other changes, the Action Agencies decided that the proposed action described in the 2000 BA should be revised to more accurately reflect the current operation of the Willamette Project with respect to the protection of ESA-listed species. In addition, the Action Agencies believed that there were a number of additional measures could be implemented using current missions, authorities, and programs that would help protect these species. These additional measures are presented in the following sections of the Supplemental BA.

Section 3.1 – Continuing Coordination and Management. This section proposes implementation of a regional forum called the Willamette Action Team for Ecosystem Restoration (WATER) and other related mechanisms to coordinate operation of the Willamette Project and implementation of ESA and related conservation measures between the Action Agencies, the Services, and other agencies and entities with water resource management and fish and wildlife responsibilities in the Willamette Basin.

Section 3.2 – Updated Description of Project Operations. This section provides an updated description of routine activities associated with operation and maintenance of fish collection and handling facilities and presents a proposal for preparing an Annual Management Plan for the facilities in coordination with the Services and other agencies. It also describes routine and non-routine activities associated with outages of turbines and regulating outlets that may have significant implications for aquatic species and habitat, and proposes mechanisms for coordinating with the Services in the event of their occurrence.

Section 3.3 – Flow Management. This section describes changes to reservoir storage and downstream flow timing and volume implemented subsequent to the 2000 BA including mainstem and tributary minimum flow objectives and ramping rate guidelines.

Section 3.4 – Hatchery Operations and Reform Actions. This section describes the operation of the five hatcheries in the Willamette Basin that were constructed and are at least partially funded by the Action Agencies as mitigation for impacts of the construction of the Willamette Project. Measures to reform operation of the hatcheries to better meet the needs of ESA-listed species are proposed.

Section 3.5 – Habitat Restoration and Management Actions. This section describes current and proposed actions for restoring degraded habitat utilized by ESA-listed species both onsite (on-project) and offsite (downstream of project) lands. This includes measures to address restoration of habitat associated with the Willamette Bank Protection Program.

Section 3.6 – Structural Modifications: Fish Passage, Temperature Control, and Hatcheries. The Action Agencies currently have limited authority and funding sources to undertake significant structural modifications at the dams to improve conditions for ESA-listed species. However, the Action Agencies propose to undertake a series of studies to evaluate the feasibility of large-scale structural modifications; where shown to be technically feasible, biologically justified and cost-effective, the Action Agencies will seek authorization and funding needed to implement those measures.

Section 3.7 – Water Quality Improvements. The Action Agencies propose to coordinate with the Services and other agencies to develop and implement a Water Quality Management Plan that describes how the projects will be operated to better meet key water quality requirements for ESA-listed species consistent with Total Maximum Daily Loads for temperature and total dissolved gas. The Action Agencies propose to operate the Cougar water temperature control facility to better meet downstream water temperature requirements of ESA-listed species. The Action Agencies also propose to undertake an extended research, monitoring, and evaluation (RM&E) program associated with Cougar Dam. Evaluation of the physical and biological outputs associated with the Cougar Dam facility are critical to the decision-process associated with the potential for structural modification of other dams in the system.

Section 3.8 – Research, Monitoring and Evaluation Program. The RM&E activities are integrated throughout the various elements of the revised proposed action described in this chapter. Effectiveness monitoring and evaluation will be critical for implementing and adaptively managing activities and measures associated with flow management, habitat restoration, hatchery operations and water quality improvements. In addition, rigorous RM&E efforts of existing baseline and possible future habitat and ESA population conditions under a range of potential structural and operational alternatives will be required to determine the feasibility of those alternatives. A mechanism for developing an integrated comprehensive RM&E program in coordination with the Services and others is proposed.

Section 3.9 – Contract Water Marketing Program. The USACE and Bureau of Reclamation propose to continue marketing irrigation water supply storage program with interim limitations to the amount of storage to be contracted and with proposed revisions water storage contracts designed to protect ESA-listed species.

Many of the actions identified in the revised proposed action are conservation measures based upon an adaptive management strategy, and are dependent on several factors: (1) availability of program funds appropriated by Congress or provided by others; (2) completion of more detailed evaluation to determine the feasibility of implementation of significant structural or operational modifications; and (3) continued RM&E resulting in better determining the biological feasibility of the alternatives being considered. Consequently, the measures required to address ESA requirements in the Willamette Basin will evolve and be refined over time. The Action Agencies believe that significant implementation of the critical elements of the revised proposed action, particularly potential large-scale structural modifications for fish passage and water temperature control, will require close consultation with the Services as feasibility and timelines are determined. Where possible, the Action Agencies have identified "off ramps" with estimated time frames to reflect the feasibility of the proposals and certainty of meeting the biological objectives.

The certainty of program funding for the actions proposed is complicated because this consultation is for the operation of an existing system. The ESA was written primarily for decisions regarding the construction of new projects where appropriate ESA mitigation measures are integrated into the project as it is being planned and developed, and total projects costs are specifically appropriated. For existing operational projects such as the Willamette Project, funding for ESA actions must be programmed and appropriated annually. The President's proposed 2008 budget now includes Willamette Basin ESA actions within the Columbia River Fish Mitigation Project. Assuming those funds are appropriated by Congress, the Action Agencies will have a funding mechanism in place to pursue implementation of many of the actions described in this Supplemental BA. If appropriate resources are not be provided for the measures described in this Supplemental BA, then the Action Agencies will consider reopening formal consultation with the Services (i.e., the off-ramp approach). On this basis, the Action Agencies requested that the Biological Opinions produced by the Services resulting from the revised proposed action be for a period of at least 15 years.

The Supplemental BA determined that corrective actions proposed by the Action Agencies in the North Santiam, South Santiam, McKenzie, and Middle Fork Willamette subbasins have the potential to increase UWR spring Chinook salmon and winter steelhead abundance, productivity, spatial distribution, and genetic diversity. These viable salmonid population (VSP) parameters may improve in response to more normalized water temperature conditions downstream of the dams in these subbasins; increased habitat complexity above or below the dams resulting from placement of LWD; improved ecosystem function and fish survival resulting from enhanced flow conditions downstream of the dams; reestablishing natural production in historic habitat located above the dams; and increased levels of marine derived nutrients in habitat located upstream of the reservoirs. The implementation of major structural components of the revised proposed action depends upon the outcome of associated feasibility studies and subsequent project authorization and funding.

In addition, corrective actions proposed by the Action Agencies in the mainstem Willamette River have the potential to increase UWR spring Chinook salmon and winter steelhead abundance and productivity. These VSP parameters may improve in response to spring and

summer flow management improvements and to improved floodplain connectivity, function, and habitat restoration. Corrective actions proposed in the Coast Fork Willamette subbasin have the potential to improve normative ecosystem functions and fish survival as a result of enhanced flow and habitat conditions downstream of the dams. Corrective actions proposed in the Long Tom River have the potential to protect and improve the survival of resident and anadromous fish species through summer flow augmentation below the dam.

The Supplemental BA recognized that there were potential adverse effects and risks associated with operation of the spring Chinook hatchery program, and that these risks varied by population. The Action Agencies, through the Oregon Department of Fish and Wildlife, plan to manage the spring Chinook hatchery program (including the spring Chinook outplanting program) as an integrated program that will reduce the overall extinction risk of UWR spring Chinook. Risks to genetic diversity will be managed and reduced over time, and improved in those basins where the hatchery population comprises a significant portion of overall abundance. Hatchery returns will contribute to overall abundance in several basins, and the outplanting program will benefit to spatial structure, and potentially productivity and abundance. Overall, the operation of the spring Chinook hatchery program as proposed should reduce the extinction risk of the UWR spring Chinook.

It was determined in the Supplemental BA that the Willamette Project is *likely to adversely affect* ESA-listed UWR spring Chinook salmon, UWR winter steelhead, bull trout, and Oregon chub located in habitat above Willamette Falls. The Willamette Project is *not likely to adversely affect* ESA-listed species located in habitat below Willamette Falls.

Of the fourteen listed and proposed endangered and threatened wildlife and plant species, it was determined that the Willamette Project is *likely to adversely affect* the following ESA-listed species: Fender's blue butterfly, Kincaid's lupine, Bradshaw's desert parsley, and Willamette daisy. The Willamette Project will have *no effect* on the gray wolf, the marbled murrelet, or golden paintbrush. The Willamette Project is *not likely to adversely affect* the remaining species of concern.